UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,808	01/09/2006	William Lindsay	H310717PCTUS	5329

			EXAMINER
28079	7590	09/20/2006	VO, HIEN XUAN

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ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/563,808	LINDSAY ET AL.
	Examiner	Art Unit	
	Hien X. Vo	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 January 2006</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☒ Claim(s) *10, 11 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>09 January 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>01/09/06</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

Information Disclosure Statement

1.   The information disclosure statement (IDS) submitted on 01/09/06. The

submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the

information disclosure statement is being considered by the examiner.

Claim Objections

2.   Claims 10-11 objected to because of the following informalities: double words

"the said" are in the sentence. Appropriate correction is required.

3.   Claims 18 objected to under 37 CFR 1.75(c) as being in improper form because

a multiple dependent claim should refer to other claims in the alternative only. See

MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form

the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public
use or on sale in this country, more than one year prior to the date of application for patent in the United
States.

4.   Claims 1, 19 rejected under 35 U.S.C. 102(b) as being anticipated by Husseiny
(U.S. Patent No. 5,210,704).

        With respect to claims 1 and 19, Husseiny discloses a system for prognosis and
diagnostics of failure and wearout monitoring and for prediction of line expectancy of
helicopter gearboxes and other rotating equipment including a method for predicting
maintenance requirements in rotating equipment normally operating in loaded and
unloaded conditions (see e.g. col. 1, lines 9-25), the method including the following
steps; coupling a sensor to apparatus associated with said rotating equipment (see e.g.
Fig. 1, 102 and col. 15, lines 60-68), said sensor being responsive to vibration in said
apparatus to generate an electric signal (see e.g. col. 16, lines 12-16); obtaining a load
signal from apparatus associated with said rotating equipment which is indicative of
whether the rotating equipment is loaded (see e.g. Fig. 17, step 929); sampling said
electric signal when the rotating equipment is loaded over a predetermined sampling
time interval to obtain a loaded electric signal (see e.g. Fig. 3); sampling said electric
signal when the rotating equipment is unloaded over a predetermined sampling time
interval to obtain an unloaded electric signal (see e.g. Fig. 22 and col. 23, lines 66-68
and col. 24, lines 1-19); and periodically displaying the relative magnitude between said
loaded electric signal and said unloaded electric signal over an extended maintenance
period of time (see e.g. col. 22, lines 23-32), a maintenance inspection being required
when the magnitude of the unloaded electric signal exceeds the magnitude of the
loaded electric signal (see e.g. col. 24).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 2-18 rejected under 35 U.S.C. 103(a) as being unpatentable over

Husseiny (U.S. Patent No. 5,210,704) further in view of Choe et al. (U.S. Patent No.

6,694,285).

With respect to claim 2-18, Husseiny discloses the invention as claimed, an alert

signal corresponding to the arithmetic ratio R between electric readings corresponding

is generated and displayed visually (see e.g. col. 19, lines 9-13), the slope of the plot is

monitored (see e.g. Fig. 18), except for teaching the sensor is selected from the group

comprising a velometer, an accelerometer and a piezoelectric crystal, the electric signal

generated is either current or voltage, the predetermined vibration frequency range

during which the electric signal is sampled is 0 to 150 Hz for rotating equipment rotating

at less than 100 revolutions per minute, the predetermined vibration frequency range

during which the electric signal is sampled is 0 to 200 Hz for rotating equipment rotating

at up to 700 revolutions per minute, the predetermined vibration frequency range during

which the electric signal is sampled is 0 to 500 Hz for rotating equipment rotating at

more than 1000 revolutions per minute, the loaded electric signal is sampled over a time

interval of 10 seconds during which the rotating equipment is fully loaded, the unloaded

electric signal is sampled over a time interval of 10 seconds during which the rotating

equipment is unloaded, sampling of the unloaded electric signal begins a predetermined

period of time after the load signal indicates that the rotating equipment is not loaded,

the loaded and unloaded electric signals correspond to the maximum electric readings

taken during said predetermined sampling time interval, electric readings corresponding

to the loaded and unloaded electric signals are averaged during said predetermined

sampling time interval to generate an average electric signal, a daily average of the

arithmetic ratio R is plotted over time, the natural logarithmic of the ratio R is plotted

over time,

Choe et al. disclose method and apparatus for monitoring rotating machine

including an accelerometer (see e.g. col. 9, lines 27-28), a piezoelectric crystal (see e.g.

col. 9, line 28), the electric signal generated is either current or voltage (see e.g. col. 1,

line 60), the accelerometer has a frequency response from 0.1Hz up to 10,000Hz, and

load samples per revolution (see e.g. Fig. 19), electric readings corresponding to the

loaded and unloaded electric signals are averaged during said predetermined sampling

time interval to generate an average electric signal (see e.g. col. 16), a daily average of

the arithmetic ratio R is plotted over time, the natural logarithmic of the ratio R is plotted

over time (see e.g. Fig. 13).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to modify Husseiny with an accelerometer, a piezoelectric

crystal, the electric signal generated is either current or voltage, the frequency response

of the sensor, the plot of the electric signal as taught by Choe et al. in order to provide

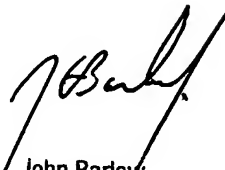an easy and effective method for developing accurate measure the electric signal of the

rotating equipment into account affect to load or unload of the machine, that would have improved the vibration analysis. Also, the frequency response of the accelerometer from 0.1Hz up to 10,000Hz that is still in the frequency range as claimed in the present application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hien X. Vo whose telephone number is (571) 272-2282. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hien Vo
09/17/06

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